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GEORGIA Power and Gas Infrastructure Project (PGIP)

Project Work Plan
For June 2010 Through June 2011

June 27, 2010 (Revised on February 9, 2011)

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech, Inc.

This report was prepared for the United States Agency for International Development, Contract No. *AID-EDH-00-08-00027 – AID-114-TO-10-00003*. USAID/Caucasus - Georgia Power and Gas Infrastructure Project, Infrastructure Oversight and Capacity Building

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TETRA TECH

February 9, 2011

[redacted]
Contracting Officer's Technical Representative
Office of Energy and Environment
U.S. Agency for International Development
11 George Balanchine Street
Tbilisi, 0131 Georgia

Re: Georgia Power and Gas infrastructure Project - Project Work Plan

Dear [redacted]:

In accordance with the requirements of EDH-I-00-08-00027-00, and on behalf of the TetraTech team, please find our revised (version 2) the Project Annual Work Plan for the Georgia Power and Gas Infrastructure Project ('PGIP'). This document provides a restatement of program objectives, describes our approach, presents the timeframe of program activities, outlines our management structure and staffing plan, and identifies key issues/risks and how we propose to mitigate.

We look forward to your review and welcome your comments and suggestions.

Very truly yours,

[redacted]
Chief of Party

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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Acronyms and Abbreviations

A/E	Architecture and Engineering
EPC	Engineer-Procure-Construct
CO	Contracting Officer
COP	Chief of Party
COTR	Contracting Officer's Technical Representative
FIZ	Free Industrial Zone
FY	Fiscal Year, October 1 through September 30 (next calendar year)
GOG	Government of Georgia
GOGC	Georgian Oil and Gas Company
GSE	Georgia State Electro System
km	Kilometer
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
LN	Local national
LOE	Level of Effort
LOP	Life of the Project
LTTA	Long Term Technical Assistance
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
mm	Millimeter
O&M	Operation and Maintenance
PMP	Performance Monitoring Plan
QA/QC	Quality Assurance/Quality Control
SOW	Statement of Work
TBD	To Be Determined
TO	Task Order
USAID	U.S. Agency for International Development
USG	U.S. Government
WO	Work Order

1. The Project's Purpose and Objective

Although much progress has been made, Georgia's infrastructure has not fully recovered from the devastation caused by the ravages of civil war, lack of regular maintenance and scant investment in physical infrastructure. New vulnerabilities have surfaced after the 2008 conflict with Russia, especially with regard to energy production and transit. The task of stabilizing and rebuilding Georgia is immense and requires the support of the donor community, as notably highlighted in the post-conflict World Bank Joint Needs Assessment.

The purpose of the Georgia Power and Gas Infrastructure Project ('PGIP' or 'Project') is to provide resident professional engineering and other technical services to support power and gas transmission improvements being undertaken by USAID on behalf of the Government of Georgia ('GOG'). The activities under this Project will support USAID's objective of promoting energy security through greater access to electricity and natural gas supplies households in Western Georgia, promote the development of the Poti Free Industrial Zone (FIZ) on the Black Sea, and secure power exports through reliability-related infrastructure improvements domestically. The activities assigned under this Task Order ('TO') will support USAID's objective of fostering sustainable development.

There are two components of the Task Order:

1.1 Component 1: Electricity Transmission Upgrade, Reconstruction, and Operation ($30,500,000 est):

Reconstruction/ Construction sub-component: USAID/Caucasus intends to completely reconstruct the Senaki 1 and 2 power transmission lines which connect the Menji 220 kV substation with the Tskaltubo 220kV substation. Site inspection demonstrates that there is little usable existing infrastructure. Most of the substation terminal equipment is damaged or not available, and one of the transformers in the Tskaltubo substation will need to be replaced.

Additionally, depending on the availability of funds (as will be directed to Tetra Tech by USAID) the project may include design and construction of a 220/110/10 kV substation at Mukhuri. This will be a new facility that would service the FIZ and surrounding area.

At this time, based on the terms of the Tetra Tech Task Order ('TO') the activities planned for Component 1 will be limited to:

- Reconstruction of the double circuit Senaki 1 and 2 220kV high voltage power transmission lines that will connect the Menji 220 kV substation with the Tskaltubo 220 kV substation. The overall length of the two circuits of transmission is estimated to be 58.8 km.

- Installation of 220kV terminal bays in the Tskaltubo and Menji substations; including requisite breakers, disconnects transformers, surge arrestors, control/protection equipment, alarm systems, buildings, etc.

The Mukhuri substation may be constructed in whole, or in part, providing that funds remain after the reconstruction of the Senaki 1 and 2 power transmission lines and the installation of bays in the Menji and Tskaltubo substations, as described above. Depending on the availability of funds, GSE will ensure financing the remainder of construction USAID initiates but cannot complete. This subcomponent is not covered in this work plan.

System monitoring and Smart Grid sub-components: USAID's intention for this subcomponent is to provide assistance to GSE on preventative maintenance regimes to optimize the productive life of critical substation equipment through the procurement and installation or replacement of substation equipment. Such equipment may include smart grid technology, transformer gas monitoring tools or replacements for existing electro-mechanical relaying. The purpose of this pilot activity is to optimize the service life of electric system assets. System outages and failure rates for transformers and other critical substation equipment increase dramatically with age. By identifying and subverting potential failures and the productive life of equipment can be vastly prolonged. Specifically, the intent is to purchase and install equipment for a number of GSE substations to optimize the productive life of critical equipment. Based on our initial discussions with USAID, GSE, and site visits we will propose a course of action for this subcomponent. Should the installed cost for the recommendation be higher than anticipated, the TetraTech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the reliability of total transmission network is improved.

1.2 Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation ($78,013,785 est.)

Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation ($79,500,000): Major results anticipated under this component include construction of a new 30.6 km, 700 mm gas pipeline from Senaki to Poti and the FIZ on the Black Sea coast, replacement of about 12 km of undersized pipeline sections with new 700 mm piping, and rehabilitation of about 48.3 km of leaking 700 mm pipe between Saguramo and Sachkhere. The work has three sub-components which have been the subject of detailed design work by GOGC.

Senaki-Poti-FIZ construction sub-component ($36.5 million est.): USAID/Georgia will construct a new 700 mm gas pipeline to Poti and further to the FIZ with a total estimated length of 30.6 km. An existing 100 mm pipeline, installed in the 1980s, has been out of service for many years. This line will be excavated and a new, 700 mm line purchased and installed on the existing easement to Poti. A new 1.6 km easement from Poti to the FIZ will be required, along which a 700 mm pipe will be laid to provide access to prospective industry in the FIZ. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life.

Saguramo-Khashuri replacement sub-component ($9.6 million est.): USAID/Georgia will replace four subsections of the existing 500 mm pipeline between Saguramo and Khashuri with new 700 mm pipeline. Existing 500mm segments, left in place during Soviet-era upgrades due to technical issues and concerns, largely cross rivers and traverse difficult terrain. Each of these remaining segments will be excavated, disconnected from the pipeline, and replaced with new pipe. The estimated total length that requires replacement is about 12 km. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life.

Saguramo-Khashuri section rehabilitation sub-component ($33.4 million est.): This sub-component will rehabilitate as many kilometers of the leaking 700 mm pipeline segments along the 100.7 km Saguramo-Sachkhere segment of the East-West main transit pipeline as funds

allow. Preliminary estimates show that USAID/Georgia's funds ($33.4 million) that will remain after construction Senaki-Poti-FIZ and replacement of 500 mm pipes at Saguramo-Khashuri section should be enough to rehabilitate up to 48.3 km of leaking 700 mm pipeline segments in two discontinuous sections between Saguramo and Sachkhere section of the East-West gas pipeline. USAID/Georgia will unearth the suspected areas to identify the degree to which the pipeline has been damaged and undertake repairs to restore the pipe to its designed functional parameters. Corrosion protection measures, including coatings and cathodic protection, as appropriate, will be employed on the new pipe to resist deterioration of the pipe and increase service life. Also, because GOGC and USAID/Georgia cannot know the exact amount of effort required to repair leaking underground pipes until the pipes are unearthed, USAID/Georgia will undertake what it can with resources remaining after contracting for the Poti-Senaki-FIZ and 500 mm pipeline replacement works has been completed. Remaining work, and the additional 40.4 km of the pipeline not addressed by USAID's efforts, will be repaired with GoG/GOGC funding.

This Annual Work Plan describes PGIP, its objectives and approach, activities planned, timelines and additional items of direct relevance to project implementation. This Work Plan addresses the planned activities for the engineering support services including preliminary design, full design, rehabilitation design, and related activities for two identified infrastructure sectors: natural gas pipelines and electricity transmission lines and ancillaries.

2. Implementation Approach and Management Activities

Activities performed under the PGIP will complement and reinforce the activities, project management and engineering expertise of USAID/Caucasus. USAID will be undertaking work from 2010 to 2013 in the energy sector in collaboration with the Georgian Oil and Gas Company ('GOGC') and Georgia State Electro System ('GSE') to upgrade, replace, and install critical selected gas and power transmission infrastructure. These companies are state-owned entities charged with the import and transit, and in the case of GSE, dispatch of electricity throughout the country.

Our overall approach to the planning and implementation of PGIP encompasses the following:

2.1 Quick Response and Rapid Mobilization

The contract with USAID was signed on May 21st. The team mobilized within days of contract signing. Both our acting Chief of Party and Deputy Chief of Party mobilized on May 31st. On June 12th, our resident pipeline construction engineer mobilized to Tbilisi. The COP mobilized on July 7th and during the interim start-up phase, [redacted] served as the Acting Chief of Party. Sufficient overlap was ensured between [redacted] and [redacted] (our COP) to allow a smooth handover of responsibilities.

To assist with start-up and rapid appraisal, an initial TDY consisting of [redacted] pipeline engineer), [redacted], electrical engineer), [redacted] (Tetra Tech, A&E IQC manager) and [redacted] (energy sector specialist) were also mobilized.

The team met with counterparts, reviewed the majority of documentation provided, furnished data requests to counterparts and completed site visits for both the natural gas pipeline and electricity transmission line projects.

All full-time local staff were in place by the end of June 2010. Local office space was secured. Project logo and website design were proposed to USAID.

2.2 Rapid Appraisal

The Tetra Tech contract SOW as presented by USAID sets the tone and baseline for the project activities. It establishes an understanding of the project, expectations, existing physical infrastructure, available information and resources provided.

As part of our mobilization efforts during the first week of the contract our management team, STTAs, along with GOGC and GSE counterparts conducted a rapid appraisal of the conditions set in the contract SOW. The Rapid Appraisal was carried out in three stages: desk study (pre-mobilization, during mobilization, post-mobilization), consultation with GOGC, GSE, MOE, and USAID, site visits of the proposed transmission lines and gas pipeline, and debriefing. The rapid appraisal helped to build a much better understanding about expectations, resources and conditions in the field. The activities planned are all subsequent tasks flow from the rapid appraisal.

2.3 Staffing

The project engineers and support staff will be managed by an expatriate senior engineering lead for each sector and will receive additional engineering support through short-term engineering assistance.

Appendixes 2 and 3 show our management and staffing plan. Appendix 4 shows the staff list and the level of efforts as it stands at this time. Modifications will be proposed and submitted formally to USAID for consideration should the necessity arise during project implementation. Appendix 5 presents a list of all technical and managerial staff envisaged for the engagement in project implementation.

As shown in Appendix 3, our planned project organization, at the highest level, USAID will coordinate all work planning and construction budgeting with the GOG. As prime contractor, Tetra Tech will have overall contract management responsibility for the US-based subcontractors and primary contact with the project contracting officer on all contractual matters.

Our Chief of Party, [redacted], will report directly to the COTR and be responsible for all technical inputs. As a power sector expert, he will also have principal responsibility for Component 1 – Electricity Transmission Upgrade, Reconstruction and Operation. This includes providing technical guidance to Tetra Tech's subcontractor, "POWER Engineers" design and construction engineers. Mr. Juvier will be supported by the Tetra Tech home office to ensure rapid response and timely decision making and commitment of funds. The COP manages the team in the field and is responsible for compliance with technical, administrative, human resources and financial requirements of the contract, USAID rules and Tetra Tech protocols. The COP approves invoices and is responsible for all the contract deliverables. COP reports to:

- USAID Mission designated COTR on all matters;
- IQC Program Manager on matters related to:
    - Quarterly technical and financial progress reporting;
    - Matters related to contractual issues requiring amendments and modifications and significant change in budget line items.

The COP works closely with the designated Contracts Manager of Tetra Tech on all contracts related matters. Tetra Tech Contracts Manager is responsible for bid pricing, contract negotiations, modifications and invoicing related to all the task orders.

Tetra Tech will manage the project office in Tbilisi and if needed a field office in Poti. Tetra Tech will be responsible for local procurement, subproject progress reporting, budgeting field operations and implementing the performance management plan. [redacted], Senior energy sector adviser will provide USAID and the COP with strategic advice on addressing challenges and obstacles in implementation.

Our Deputy Chief of Party, [redacted]s responsibilities will include liaison with GSE and GOGC, management of our long-term Georgian technical team and providing support to COP as necessary.

Our Senior Engineer, [redacted], will have primary responsibility for the implementation of Component 2, Gas Transit Infrastructure Construction, Replacement and Rehabilitation. As an [redacted]), he will access [redacted]'s design and construction engineers as needed.

Analogue approach will be used for Electricity component. Selection of a candidate is in process.

Tetra Tech has included five CCN full time technical staff to support transmission line/substation design and construction, gas pipeline design and construction, and environmental compliance.

We have also proposed US and Georgian short-term technical specialists to support our key and long-term personnel.

2.4 Quality Assurance and Quality Control

Tetra Tech will require that Quality Assurance and Quality Control (QA/QC) is maintained during all phases of this project.

The purpose of QA/QC is to ensure technical completeness, efficiency,, constructability, simplicity, compliance with budget,, schedule, and achieving consistent, quality results. Adjustments will be made when necessary and applicable to reflect realities of USAID and host country preferences, conditions, available materials and O&M considerations.

The QA/QC process is implemented through our overall Quality Management program. Quality Management is a continual process of review and supervision that is conducted at every stage of the project. Each of the team members has a documented internal Quality Management program. Each team member will conduct their respective activities in accordance with their internal Quality Management procedures. In addition, Tetra Tech will conduct their own independent review of the deliverables at various stages of the project. Collectively, these efforts will ensure that Quality Management is maintained throughout the development of the overall project. Tetra Tech's QA/QC process is applied in addition to QA/QC that Tetra Tech's subcontractors, TROW Engineering and POWER Engineering internally apply to products and deliverables they are responsible for.

We have built quality management into this task order. In our plan we are proposing that our designated design quality manager Mr. Tom Chicca perform the following activities:

- Establish QA/QC goals and objectives at the start and communicate these with the project team;
- Develop proper attitude for quality and promoting that QC is everyone's job;
- Independent review of the key deliverables;
- Liaise, interface, and coordinate with the quality managers of TROW and POWER
- Perform periodic audits.

The primary responsibilities for QA/QC under this contract are:

- COP for the overall quality of all the deliverables;
- POWER QA/QC Manager: for all the design related to Component 1
- TROW QA/QC Manager: for all the design related work under Component 2
- Tetra Tech Design Quality Manager.

2.5 Design Activities

The preliminary design work will be carried out by the project team in close working relationship with GSE in Tbilisi under the leadership of the COP and DCOP with the support from the home office and engineering staff. The team will further review the design work undertaken by GOGC. All design and design review efforts will be completed at home offices of Tetra Tech, POWER and TROW. This will allow our team the flexibility to complete or review the design as applicable, drafting, specifications and bid documents with the appropriate team members, and under the supervision and mentoring of expatriate engineers. There is a need for geotechnical and land survey information as pre-design activities. Subcontracting for some required services such as detailed land surveys and geotechnical work will be handled locally by GOGC for Gas component of the Project and by the PGIP team for the Electricity component).

Quality assurance procedures will be incorporated into the design process, and quality control will be maintained throughout the design process.

2.6 Tender Documents

For Component 1: The project team will prepare the necessary procurement documentation for rehabilitation/construction of transmission line and substations, for implementation of “smart grid” component and work closely with GSE engineers to develop capacity in this area. For GSE, the project team will be responsible for developing the complete set of tender documentations and assisting USAID during the entire procurement process.

For Component 2: The project team will review and provide an opinion to USAID about the procurement documents for gas component prepared by GOGC. The tenders for construction related work will largely target local and regional firms. After completion of advertisement for the material and construction projects we will assist GOGC, on an as needed basis, with pre-bid conferences. For the tender documentation of GOGC, the project team’s role will include assistance to prepare specifications and technical documentation and guidance.

2.7 Construction Oversight

Tetra Tech team’s expatriate and Georgian engineers will work closely with the engineers of GOGC and GSE and the construction contractors for the planned infrastructure. Our construction oversight staff will be responsible for inspection, testing, and QC at all sites.

Construction contractors will carry out construction. For Electricity component, testing of final substation and transmission line energizing will be the responsibility of GSE supported by PGIP team. GOGC will be responsible for carrying out final tests upon completion of the pipeline construction. PGIP engineers will be present at all stages of testing and present their

independent observations to USAID. In addition to frequent construction supervision by our field-based teams at each site, frequent field meetings will be held with the construction contractors and project staff to evaluate progress and address any issues which may arise. Reports from these meetings will be provided to USAID, GOGC and GSE..

The project team will provide spot inspections at key junctures such as pipe placement, concrete and reinforcement placement, testing start up and commissioning. The team will develop a punch list of final improvements and final inspections will be made prior to the infrastructure being turned over to GOGC and GSE.

2.8 Capacity Building

In developing this work plan and during the course of the project implementation we have and will place capacity building at the forefront of all activities. We will work closely with the MOE, GOGC and GSE, local governments, as well as the construction contractors to develop project-specific capacity through on-the job-training and mentoring.

Should there be a need to carry out a tailored training program or capacity building of other form, Tetra Tech will discuss such necessity with USAID and develop a separate implementation plan.

2.9 Procurement Plan

We will closely follow the 752.225-71 Local Procurement (FEB 1997) as articulated below:

- Local procurement involves the use of appropriated funds to finance the procurement of goods and services supplied by local businesses, dealers or producers, with payment normally being in the currency of the cooperating country.

- Covered by source/origin and nationality waivers as set forth in Subpart F of 22 CFR Part 228 except as provided for in 22 CFR 228.40, local procurement.

Three distinctly separate sets of procurement processes will include:

- The equipment and furniture related to the project office;

- Transmission Line Monitoring and “Smart Grid” related equipment and software. After full consultation with USAID, GSE and GOGC we will propose a list of equipment with prices and specifications and supporting documentation and after approval is obtained we will follow USAID procurement regulations/procedures to procure, deliver and install.. A limited level of training will be necessary after installation of software and equipment and we shall seek that such training is provided by the vendors.

- For Component 2 construction related material and equipment - These are procured by GOGC and the project team’s role in this component will be solely advisory.

- For Component 1, all construction related material and equipment - Activities will be carried by USAID with the Tetra Tech’s organizational assistance.

2.10 Environmental Assessment

The first stage of the EA process is completion of a scoping study although in the case of the Senaki - Poti extension of Component 2, the scoping study was not done given that the Environmental Permit has already been obtained. Additional work was carried out to supplement the completed Environmental Study in order to meet the requirements of USAID BEO. Other aspects of the program will likely require a scoping study. The role of the Tetra Tech is to provide assistance to GOGC on development of the Scoping Statement and EA documents. GOGC is entitled to finalize documents and submit them for relevant approval to Georgian State authorities and USAID.

The scoping study will provide a determination of the scope and significance of issues to be analyzed in the EA, including direct and indirect effects of the project on the environment. Consultation with affected parties will be one of the key activities of the scoping phase. According to USAID development principles, broad stakeholder input will be sought to help identify opportunities to better achieve results, and, therefore, our assistance to GOGC in consultation process will be developed to reflect these principles.

In case of the electricity component, the Tetra Tech team will lead the development of the EA.

The EA will be based upon the scoping statement and will address the following elements, as appropriate:

- Purpose and project description. The EA will briefly specify the underlying purpose and need of the proposed action. A summary of the project description will also be provided.

- Alternatives including the proposed action. This section will present the environmental impacts of the proposal and its alternatives in comparative form, thereby sharpening the issues and providing a clear basis for choice among options by the decision makers.

- Affected environment. The EA will succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. Environmental and social characteristics to be included in the study will include physical resources (such as topography, soils, and seismic and geological characteristics); natural biological resources; other environmental concerns noted by 22 CFR 216 (such as land use and historic and cultural resources) and additional environmental concerns (such as socioeconomic characteristics, public health, and other infrastructure systems).

- Environmental Consequences. This section will include the environmental impacts of the alternatives including the proposed action, any adverse effects that cannot be avoided should the proposed action be implemented, and means to mitigate adverse environmental impacts. The impacts of the project will be assessed against all of the environmental characteristics outlined under the existing conditions. Results of the EA will identify the least environmentally damaging feasible alternatives for excavation, transport, and deposition of the hotspot areas and will identify appropriate mitigation measures associated with these activities.

- Environmental Management Plan. We will assist GOG agencies to prepare an environmental management plan (EMP) to ensure mitigation of adverse impacts to wildlife and human health and worker exposure to dioxin resulting from waste removal and containment. The EMP will be structured to include sections relating to the proposed

mitigation measures; a monitoring plan to ensure that issues such as water quality are monitored continuously around the wetlands and the new landfill site; training requirements to ensure that the EMP is properly implemented; and the financial costs of the mitigation and monitoring. The EMP will also be structured to ensure that these considerations are incorporated into remediation design.

A draft EA will be prepared and submitted for review to both USAID for review and comment. In addition, the draft EA will be disclosed to members of the public according to the schedule and methodology outlined in the approved scoping study.

In addition to USAID EA requirements, the Tetra Tech Team will also help if needed with the development of the EA to adhere to Georgian requirements. In general, the format required for a Georgian EA is similar to that required by USAID, but it may involve a greater emphasis on consultation with affected communities. The EA report will be structured to satisfy the requirements of both USAID and the GOG.

2.11 Health and Safety Plan and Onsite Worker Health and Safety Training Plan

We propose that GOGC and GSE undertake a health and safety program for this project that will be focused on preventing personnel from being exposed to construction related risks. The program should involve the preparation of health and safety plans (HASP) and onsite worker health and safety training plans for construction phases. The health hazard monitoring program should include the following elements:

- Medical surveillance program (initial, annual, and exit examinations);
- Specifying additional medical monitoring when appropriate;
- Careful selection of appropriate environmental monitoring instruments;
- Careful calculation of instrument action levels and response measures;
- Collecting samples and other data on potential exposures (such as air samples).

All personnel engaged in field work must first successfully complete health and safety training. Tetra Tech is in a position to provide assistance in this area should this be requested by USAID. If requested, Tetra Tech can advise USAID on how to build health and safety into the construction activities which will be procured by USAID for power line and substation construction.

2.12 Performance Monitoring Plan

Tetra Tech has developed and submitted to USAID a performance monitoring plan (PMP) to support high-quality project management and maximize project impact. The PMP was developed using a results-based planning approach. The PMP was developed based on the project hypothesis and includes project indicators, logical framework and target values.

2.13 Additional support services

Tetra Tech will provide to USAID technical support for procurement processes, including evaluation of bidding specifications, invitations for bid, bid evaluation, commodities procurements, and contract modifications, among others;

Tetra Tech will prepare and/or review reports and recommendations as to general arrangements, viability and cost effectiveness of capital plans and processes; as to validity and economy of work plans; and for changes, additions or revisions in project activities;

Tetra Tech will develop solutions to complex project and program architecture and engineering (A/E) issues unresolved by implementers;

Tetra Tech will provide value engineering services;

Tetra Tech will provide technical assistance to the COTR in responding to proposed changes in the USAID construction contract(s), SOWs, reviewing the validity of claims and providing recommendations for USAID responses and evaluating the reasonableness of contract time extensions;

Tetra Tech will provide appropriate technical assistance to the COTR in issuance and negotiations of change orders in accordance with procedures;

Tetra Tech will perform administrative responsibilities including but not limited to activities such as drafting project implementation letters, preparing action memoranda and reports; estimating expenditures, reviewing payment vouchers, responding to audits, assessing claims, and performing other related activities.

Tetra Tech will provide analysis of risks associated with natural disasters and the design of structures and services to appropriate building standards in order to better withstand such disasters; and analysis, evaluation and preparation of plans and procedures for maintenance and operations. Tetra Tech will advise the benefiting companies and USAID on appropriate building standards that should be followed during the construction.

2.14 Public Relations and Branding

We will be transparent with the stakeholders and will provide advisory support to USAID, GOGC and GSE in the public relations activities under this project. At all times we will comply with the project's Branding and Marking Protocol (see Appendix 6). Our COP will be responsible for ensuring that branding and marking protocols are followed.

2.15 Project Deliverables

	Deliverables	Due Date
1	Work Plan	Within 30 days of TO award for year 1 and consecutively for the remainder of project 60 days prior to end of fiscal year
2	Performance Monitoring Plan	Within 45 days of TO award
3	Annual Progress Reports	30 days after end of fiscal year
4	Quarterly Progress Reports	10 days after end of each quarter
5	Monthly progress meetings with COTR	Monthly on agreed dates
6	Assist GOGC and GSE in preparing Monthly progress reports	Monthly submitted on agreed dates
7	Final Project Report	End of project
8	Periodic Success Stories	To be agreed with USAID, GOGC and GSE
9	Other*	

*Specific deliverables related to review of design and construction supervision, providing expert opinion or rendering other type of professional support to USAID for each project component are described in sections 3.1 and 3.2. Further Tetra Tech will agree with COTR, should there be a requirement to submit other deliverables such as weekly reports or hold special standing or ad hoc coordinating meetings with USAID and the counterparts.

3. Approach to the Task Activities

3.1 Component 1: Electricity Transmission Upgrade, Reconstruction, and Operation ($30,500,000 est):

During the reconstruction of the Senaki 1 and 2 power transmission lines which connects the Menji 220 kV substation with the Tskaltubo 220kV substation the project team will evaluate the following project components:

1. Scope of Work, including design basis, electrical capacity, transmission delivery, substation adequacy and operating conditions.
2. Construction contract documents based on Engineer-Procure-Construct (EPC) delivery
3. Materials Acquisition Plan, including evaluation of long-lead items and receipt and storage requirements
4. Construction Quality Control Plans and Construction Progress
5. Construction Completion and Turnover to Operations
6. Commissioning and Startup
7. EPC Contractor's Project Schedule with Milestones and Deliverables

The following identifies specific tasks and subtasks for the Senaki 1 and 2 transmission lines and the Tskaltubo and Menji substations.

3.1.1 Senaki 1 and 2 Transmission Lines and Substations

1. Engineering and Design

Subtask 1.1
Task: The work will include a review of the design basis for the Senaki 1 and 2 power transmission lines, and the present condition of the Menji and Tskaltubo 220 kV substations. The design basis will be for preparation of performance drawings and specifications to allow for an EPC contract.

Subtask 1.2
Description: Review all existing drawings (plan and profile, structure detail/loadings, general arrangements, plans and sections and control and relay), previous engineering studies (geotechnical, metrological, etc.) and applicable standards. Following the review, prepare a summary opinion regarding the approach to reconstruction of the required facilities. Required ground surveys and geotechnical investigations are to be completed by local Georgian contractors.

[redacted]

Subtask 1.3
Description: For the Senaki 1 and 2 power transmission lines, all existing transmission towers and foundations will be replaced. This requirement is based upon field investigations. Work will include review of engineering drawings, tangent and angle tower locations, geotechnical information, metrological data, GSE tower detail loading, Optical Ground Wire (24 fiber - OPGW) standards, grounding requirements, and conductor and insulator requirements. In addition to pertinent GSE standards, the transmission design will conform to U.S. NESC "Heavy Loading" standards. All access road improvements and right-of-way clearing will be provided by local Georgian contractors. Any obstructions on the right of way that will conflict with the construction of the transmission line will be relocated by local Georgian contractors. We will develop performance based Contract Documents including drawings and specifications required for EPC construction.

[redacted]

Subtask 1.4
Description: For the Menji and Tskaltubo 220 kV substations the present grounding grids cannot be verified to be sufficient to accommodate the transmission line rebuild and equipment replacement and comply with GSE's standards. Also, the existing substation lightning protection is not sufficient, geotechnical data is not available, existing equipment support structures are incapable of support of any new required equipment, and the existing control houses are not sized to adequately accept new equipment. The design at the Menji substation will include the removal of wave traps and associated equipment, replacement of disconnects and switches, replacement of circuit breaker with SF6 breaker and installation of OPGW fiber optic terminals and the installation of line differential relaying and breaker control panels. The design at the Tskaltubo substation will include the removal of wave traps and associated equipment, replacement of disconnects and switches, replacement of circuit breaker with SF_6 breaker, installation of OPGW fiber optic terminals, the installation of line differential relaying and breaker control panels. Also included is the replacement of an existing 220/110kV autotransformer. We will develop EPC performance based Contract Documents including drawings and specifications required for construction.

[redacted]

Subtask 1.5
Description: The Mukhuri substation is planned as a seven (7) terminal substation with an unknown in-service date. Should sufficient funding remain at the completion of the required Senaki upgrade project, initial design efforts for the Mukhuri substation will begin. The work will include the preparation of a feasibility analysis of the design and construction of the substation. The analysis will include a feasibility discussion, project schedule with milestones and an estimated construction cost.

[redacted]

Subtask 1.6
Description: GSE has expressed a desire optimize the productive life of critical substation equipment through the procurement and installation or replacement of substation equipment. Such equipment may include smart grid technology, transformer gas monitoring tools or replacements for existing electro-mechanical relaying. A pilot program approach will be used optimize the service life of electric system assets. By identifying and subverting potential failures

and the productive life of equipment can be vastly prolonged. Should the installed cost for the recommendations be higher than anticipated, the TetraTech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the reliability of total transmission network is improved.

[redacted]

2. Construction

Subtask 2.1
Description: Prepare a construction execution plan, construction specifications and construction schedule for the Senaki 1 and 2 transmission lines and the Tskaltubo and Menji substations to determine the feasibility of meeting project milestones and objectives. All construction plans and documents are to be prepared based on performance specifications and an EPC project delivery.

[redacted]

3. Materials Acquisition Plan

Subtask 3.1
Description: Review material lists for transmission lines and substations for completeness. Identify items with long-lead delivery times (i.e., transformers, switches, disconnects, CTs, conductor, steel, etc.). Work with USAID and GSE to assure timely procurement for use by the construction contractor. Reconcile material lists with requisition plans and purchase orders. Review the materials control system.

[redacted]

Subtask 3.2
Description: Materials Receipt and Storage – Assess the material receiving and storage protocol and facilities prior to mobilization; conduct regular (once a month) site visits to inspect the materials and compare inventory with material records and custody transfer to construction contractor.

[redacted]

4. Construction Quality Control and Progress

Subtask 4.1
Description: Construction Inspection – Site inspection and review of quality control inspection process, including reporting procedure and forms, spot-check of contractor and GSE inspector in process of quality control inspections, and review of inspection reports and documentation. Full-time construction inspection to be conducted by Georgian locals.

[redacted]

Subtask 4.2
Description: Construction Progress Schedule – Develop a construction schedule based on construction plans and contract documents and report on construction progress via Microsoft Project. Reporting will identify construction spreads and key construction crews.

[redacted]

5. Construction Completion and Turnover to Operations

Subtask 5.1
Description: Assist USAID and GSE in evaluation of the completed total installed facilities. Work will include development of a punch list and certification of completion. We will also assist in the process of custody of transfer of facilities.

[redacted]

6. Commissioning and Startup

Subtask 6.1
Description: Review the commissioning and startup plan for the transmission line and substations as prepared by the EPC contractor.

[redacted]

Subtask 6.2
Description: Assist and observe the commissioning and startup of the transmission line and substations. Testing activities are outside the scope of this contract.

[redacted]

7. Project Schedule with Milestones and Deliverables

Subtask 7.1
Description: The following is a listing of proposed deliverables for the Senaki 1 and 2 transmission lines:

- Scope of Work narrative
- Design criteria
- Relay and protection schemes
- Plan and Profile drawings
- Typical tower types
- Typical foundation types
- Specifications
    - Tower and associated hardware
    - Conductors
    - Foundations
    - Insulator Assemblies
    - Miscellaneous hardware
- Performance based construction contract documents for EPC project delivery

[redacted]

Subtask 7.2

Description: The following is a listing of the proposed deliverables for the Tskaltubo and Menji substations:

- Scope of Work narrative
- Design criteria
- One-line diagram
- General Arrangement drawings
- Elevation Plan drawings
- Grounding Plan drawings
- Typical foundation types
- Specifications
    - Structures
    - Foundations
    - Transformer
    - Switching equipment
    - Conductors
    - Grounding
    - Relay and protection equipment
- Performance based construction contract documents for EPC project delivery

[redacted]

3.1.2 System monitoring sub-component

USAID's intention for this subcomponent is to provide assistance to GSE on preventative maintenance regimes to optimize the productive life of critical substation equipment through the procurement and installation of sensors and associated computer software and networking equipment. The purpose of this pilot activity is to optimize the service life of electricity transmission assets by monitoring gas concentrations in dielectric transformer fluids in real time across the network and benchmarking those concentrations against industry standards to predict catastrophic failure before it happens. Failure rates for transformers and other critical substation equipment increase dramatically with age, and the increasing presence of certain gas concentrations in dielectric fluids has been shown to be indicative of imminent failure. By identifying and subverting potential failures, explosions that destroy transformers and associated equipment can be substantially avoided, and the productive life of equipment can be vastly prolonged. Specifically, the intent is to purchase and install dissolved gas analysis technology and associated IT assets in a number of GSE substations to optimize the productive life of critical substation equipment (e.g. transformers). Based on our initial discussions with USAID, GSE, and site visits we propose the following activities for this subcomponent.

There are 48 high voltage/system critical transformers in the GSE system. Based on provisional analyses it is realistic to equip major high voltage transformers with the gas analysis technology, but for making final conclusions and estimations, more detailed study is needed. If dedicated budget of the $1 million will not cover all necessary points, the TetraTech team will work with GSE to prioritize the installations for USAID financing, while at the same time encouraging GSE to self-finance the remainder, to ensure that the total transmission network is covered by the gas analysis technology.

3.1.3 Smart grid technology sub-component

USAID/ Georgia intends to provide assistance to GSE in identifying and installing smart grid technologies that will increase the reliability and efficiency of the Georgia power transmission grid. Smart grid technologies optimize the integration of electrical (towers, lines. switches, transformers, etc.) and information infrastructures (computerized remote control network) by incorporating new automation and information technologies into the existing network. Such technologies can eliminate redundancies in power production and dispatch that cause waste and overload/ disrupt networks, and can optimize the routing of power from production to demand.

After our initial meetings with USAID and GSE we propose the following activities for this subcomponent. It is evident that the more sophisticated versions of Smart Grid, such as superconductive lines or 'smart' inclusion of renewable energy sources into the grid, is beyond the current needs of GSE and the broader energy system. The PGIP team will perform more detailed studies for finding feasible solutions and will present relevant findings in a report.

3.2 Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation ($78,013,785 est.)

Major results anticipated under this component include construction of a new 30.6 km, 700 mm gas pipeline from Senaki to Poti and the FIZ on the Black Sea coast. The work has been sub-divided into four sub-components (Lots I, II, IIII and IV), which were the subject of detailed design work by GOGC.

The scheduled completion date for construction of the new project is December 31, 2010. In an effort to expedite the project, the project used is moving forward at a 'break neck' pace and based on the commitment of the State to a foreign investor/operator of the FIZ, needs to be operational by the end of this year. An option to accelerate the project is to use approximately 27 km of 700 mm pipe already in GOGC's possession, with the USAID procurement essentially a 'swap' arrangement. The pipe already at GOGC was intended for other projects, but given the priority, the pipe already in inventory was proposed to be used to commence the pipeline construction. USAID's approved the 'swap' arrangement.

After our rapid appraisal, detailed discussions with USAID and GOGC, and site visits we propose the following activities. In support of Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation, the project team will consist of one full time professional engineer located in Tbilisi and support engineering and administration in the US. The lead professional engineer will make trips to Georgia as necessary to provide professional consultation, including of contractor mobilization and key construction activities and to support construction activities. The pipeline design engineer will make a trip to Georgia to provide professional support as identified below in the design activities..

For each of the sub-components of Component 2: Gas Transit Infrastructure Construction, Replacement, and Rehabilitation, the Work Plan will be managed under the following categories:

1. Scope of Work, including design basis, capacity, natural gas delivery points and operating conditions.

2. Engineering and Design.

3. Health and Safety.

4. Request for Proposals / Invitation To Bid / Tender Offer Review.

5. Construction Plan.

6. Land Rights – Permission to construct the pipeline.

7. Materials Acquisition, including purchase order, production/manufacture, acceptance, logistics and delivery, and receipt and materials storage.

8. Construction Quality Assurance and Progress Reporting.

9. Project Control Schedule and Cost, including Milestones and Deliverables.

3.2.1 Senaki-Poti-FIZ construction sub-component

This 29.55 km section of 700 mm pipeline is required to be in service by December 31, 2010. The project team will evaluate the following project components:

The following identifies specific tasks and subtasks for the Senaki-Poti-FIZ pipeline construction sub-component. [Each of the tasks associated with the Senaki-Poti-FIZ pipeline construction sub-component are designated by the prefix “A”]

A1. Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

Subtask A.1 Scope of Work Review
Description: Review scoping documents, including the Environmental Impact Assessment related to technical engineering (Section 3, “Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.

[redacted]

A2. Engineering and Design

Subtask A2.1 Engineering Review (preconstruction)
Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

[redacted]

Subtask A2.2 Engineering Review (construction phase)
Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.
[redacted]

A3. Health and Safety

Subtask A3.1 Review GOGC Health and Safety Plan
Description: Review GOGC's Health and Safety Plan for the planned project activities and identify areas of improvement.
[redacted]

Subtask A3.2 Review GOGC Contractor Health and Safety Plan
Description: Review the contractors' Health and Safety Plan for the planned construction activities and identify areas of improvement.
[redacted]

A4. Request for Proposals / Invitation For Bid / Tender Offer Review

Subtask A4.1 Review of Proposal Documents
Description: Review RFP, IFB, TO documents prior to letting for bid.
[redacted]

Subtask A4.2 Observe Bid Openings
Description: Be present to observe bid openings for RFP, IFB, TO documents.
[redacted]

A5. Construction

Subtask A5.1 Construction Plan
Description: Review construction execution plan, construction specifications, construction schedule to assess the feasibility of meeting project objectives.
[redacted]

Subtask A5.2 Hydrostatic Testing
Description: Review hydrostatic test plan and hydrostatic tests.
[redacted]

Subtask A5.3 NDE
Description: Review non-destructive examination (NDE or X-Ray inspection) test results.
[redacted]

A6. Land Rights – Permission to construct the pipeline

Subtask A6.1 Right of Way (ROW) Permission
Description: Review status of right-of-way permission (determine existing rights of GOGC to maintain and upgrade facilities on existing ROW).

[redacted]

Subtask A6.2 Landowner Interface
Description: Review landowner interactions and identify landowner issues.

[redacted]

A7. Materials Acquisition

Subtask A7.1 Material List Review
Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system

[redacted]

A8. Construction Quality Assurance, Environmental Compliance and Progress Reporting

Subtask A8.1 Construction Inspection
Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.

[redacted]

Subtask A8.2 Environmental Compliance Plan Review
Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.

[redacted]

Subtask A8.3 Environmental Compliance Monitoring
Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.

[redacted]

Subtask A8.4 Progress Schedule
Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[redacted]

Subtask A8.5 Construction Completion and Turnover to Operations
Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to GTC.

[redacted]

A9. Project Control Schedule, including Budget, Milestones and Deliverables

A9.1 Develop Gas Transit Oversight Schedule
Description: Develop an overall schedule of oversight activities and deliverables to be reported. [redacted]

A9.2 Provide Schedule Updates
Description: Report progress and deviations.
[redacted]

A9.3 Review Project Cost Estimate
Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.
[redacted]

A9.4 Provide Cost Expenditure Updates
Description: Provide review and recommendations of contractor progress payments based on work completed.
[redacted]

3.2.2 Saguramo-Khashuri replacement sub-component:

The following identifies specific tasks and subtasks for the Saguramo-Khashuri replacement sub-component [Each of the tasks associated with the Saguramo-Khashuri replacement sub-component are designated by the prefix “B”]

Based on the conversations with GOGC to date, construction is anticipated to begin in 2011. The planned construction dates need to be confirmed by GOGC.

B1. Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

Subtask B1.1 Scope of Work Review
Description: Review scoping documents, including the Environmental Impact Assessment developed by GOGC related to technical engineering (Section 3, “Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.
[redacted]

B2. Engineering and Design

Task: Review of Engineering and Design Plan.

Subtask B2.1 Engineering Review (preconstruction)
Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

[redacted]

Subtask B2.2 Engineering Review (construction phase)
Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.

[redacted]

B3. Health and Safety

Subtask B3.1 Review GOGC Health and Safety Plan
Description: This activity was conducted under Subtask A3.1. Review plan for modifications based on experience in completed work.

[redacted]

Subtask B3.2 Review GOGC Contractor Health and Safety Plan
Description: Review the contractors' Health and Safety Plan for the planned construction activities and identify areas of improvement.

[redacted]

Subtask B3.3 Construction Safety
Description: Provide spot reviews of the HSS inspector and ongoing review of HSS reports and HSS performance statistics

[redacted]

B4. Request for Proposals / Invitation For Bid / Tender Offer Review

Subtask B4.1 Review of Proposal Documents
Description: Review RFP, IFB, TO documents prior to letting for bid.

[redacted]

Subtask B4.2 Observe Bid Openings
Description: Be present to observe bid openings for RFP, IFB, TO documents.

[redacted]

B5. Construction

Subtask B5.1 Construction Execution Plan
Description: Review construction execution plan, construction specifications, construction schedule to assess the feasibility of meeting project objectives.

[redacted]

Subtask B5.2 Hydrostatic Testing
Description: Review hydrostatic test plan and hydrostatic tests.
[redacted]

Subtask B5.3 NDE
Description: Review non-destructive examination (NDE or X-Ray inspection) test results.
[redacted]

B6. Land Rights – Permission to Construct the Pipeline

Subtask B6.1 Right of Way (ROW) Permission
Description: Review status of right-of-way permission. Since this is existing right of way, it is expected that this review will be conducted quickly.
[redacted]

Subtask B6.2 Landowner Interface
Description: Review landowner interactions and identify landowner issues.
[redacted]

B7. Materials Acquisition Plan

Subtask B7.1 Material List Review
Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system
[redacted]

B8. Construction Quality Assurance, Environmental Compliance and Progress Reporting

Subtask B8.1 Construction Inspection
Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.
[redacted]

Subtask B8.2 Environmental Compliance Plan Review
Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.

Personnel involved in this review: Sophie Berishvili supported by Karen Menczer.

Subtask B8.3 Environmental Compliance Monitoring
Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.

[redacted]

Subtask B8.4 Progress Reporting Schedule
Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[redacted]

Subtask B8.5 Construction Completion and Turnover to Operations
Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to GTC.

[redacted]

B9. Project Control Schedule, including Budget, Milestones and Deliverables

Subtask B9.1 Develop Gas Transit Oversight Schedule
Description: Develop an overall schedule of oversight activities and deliverables to be reported.

[redacted]

Subtask B9.2 Provide Schedule Updates
Description: Report progress and deviations.

[redacted]

B9.3 Review Project Cost Estimate
Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.

[redacted]

Subtask B9.4 Provide Cost Expenditure Updates
Description: Provide review and recommendations of contractor progress payments based on work completed.

[redacted]

3.2.3 Saguramo-Khashuri section rehabilitation sub-component:

The following identifies specific tasks and subtasks for the Saguramo-Khashuri section rehabilitation sub-component [Each of the tasks associated with the Saguramo-Khashuri section rehabilitation sub-component are designated by the prefix “C”]

The schedule provided by GOGC indicates that construction of this work, including sections D, E, F and I will begin on March 14, 2011 and will be completed on September 23, 2011. This

work is expected to be conducted after sections A, B and H. Therefore, the planned dates have not been determined. planned construction dates need to be confirmed by GOGC. The review of this work plan has not been done. Accordingly, the dates have not been included.

C1. Scope of Work

Task: The work will include a review of the design basis, capacity, natural gas delivery points and operating conditions.

Subtask C1.1 Scope of Work Review
Description: Review scoping documents, including the Environmental Impact Assessment related to technical engineering (Section 3, "Technical Engineering Data of the Gas Pipeline), hydraulics and capacity, applicable standards (ASME, API, ASTM, BSI, Russian Standards and Georgian governmental regulations). Following the review, prepare a summary opinion regarding compliance with these requirements.

C2. Engineering and Design

Task: Review of Engineering and Design Plan.

Subtask C2.1 Engineering Review (preconstruction)
Description: Review engineering alignment sheets, typical drawings, site specific drawings, ownership maps, environmental exclusion areas, specifications, drawings, pulsation characteristics, cathodic protection, delivery meters, gas delivery station and other engineering and design plans. Following the review, prepare a summary opinion of the adequacy of the engineering and design.

Subtask C2.2 Engineering Review (construction phase)
Description: Review engineering activities during construction, including collection and processing of as-built data, preparation of as-built drawings, hydrostatic test data, design changes, and other engineering activities in support of construction.

C3. Health and Safety

Subtask C3.1 Review GOGC Health and Safety Plan
Description: This activity was conducted under Subtask A3.1. Review plan for modifications based on experience in completed work.

Subtask C3.2 Review GOGC Contractor Health and Safety Plan
Description: Review the contractors' Health and Safety Plan for the planned construction activities and identify areas of improvement.

Subtask C3.3 Construction Safety
Description: Provide spot reviews of the HSS inspector and ongoing review of HSS reports and HSS performance statistics

[redacted]

C4. Request for Proposals / Invitation For Bid / Tender Offer Review

Subtask C4.1 Review of Proposal Documents
Description: Review RFP, IFB, TO documents prior to letting for bid.

[redacted]

Subtask C4.2 Observe Bid Openings
Description: Be present to observe bid openings for RFP, IFB, TO documents.

[redacted]

C5. Construction

Subtask C5.1 Construction Execution Plan
Description: Review construction execution plan, construction specifications, construction schedule to assess the feasibility of meeting project objectives.

[redacted]

Subtask C5.2 Hydrostatic Testing
Description: Review hydrostatic test plan and hydrostatic tests.

[redacted]

Subtask C5.3 NDE
Description: Review non-destructive examination (NDE or X-Ray inspection) test results.

[redacted]

C6. Land Rights – Permission to construct the pipeline

Subtask C6.1 Right of Way (ROW) Permission
Description: Review status of right-of-way permission. Since this is existing right of way, it is expected that this review will be conducted quickly.

[redacted]

Subtask C6.2 Landowner Interface
Description: Review landowner interactions and identify landowner issues.

[redacted]

C7. Materials Acquisition Plan

Subtask C7.1 Material List Review
Description: Review the material list with the engineering plans for completeness of required materials, including materials to be procured by GOGC and materials to be provided by contractor. Reconcile the material list with the requisition plan and the purchase orders. Review the materials control system

[redacted]

C8. Construction Quality Assurance, Environmental Compliance and Progress Reporting

Subtask C8.1 Construction Inspection

Description: Construction Inspection – Site inspection and review of quality control inspection process, environmental compliance with permit and specifications requirements, including reporting procedure and forms, spot-check of contractor and GOGC inspectors in the process of quality control inspection, and review of inspection reports and documentation.

[redacted]

Subtask C8.2 Environmental Compliance Plan Review

Description: Environmental Compliance Plan – Review environmental conditions for construction activities for compliance with regulations.

[redacted]

Subtask C8.3 Environmental Compliance Monitoring

Description: Environmental Compliance Monitoring – Review construction activities for compliance with environmental conditions.

[redacted]

Subtask C8.4 Progress Reporting Schedule

Description: Construction Schedule Progress Reporting – Develop a construction schedule based on construction plans provided by GOGC and report on construction progress via Microsoft Project, identifying construction spreads and key construction crews.

[redacted]

Subtask C8.5 Construction Completion and Turnover to Operations

Description: Assist GOGC in the evaluation of the total installed facilities, in the development of a punch list and certifying completion for custody transfer of facilities to GTC.

[redacted]

C9. Project Control Schedule, including Budget, Milestones and Deliverables

Subtask C9.1 Develop Gas Transit Oversight Schedule

Description: Develop an overall schedule of oversight activities and deliverables to be reported.

[redacted]

Subtask C9.2 Provide Schedule Updates

Description: Report progress and deviations.

[redacted]

C9.3 Review Project Cost Estimate

Description: Review the project cost estimate, including evaluation of detailed cost estimate basis, where appropriate.

[redacted]

Subtask C9.4 Provide Cost Expenditure Updates

Description: Provide review and recommendations of contractor progress payments based on work completed.

[redacted]

3.2.4 Timeline and Deliverables

Project advisory activities are based on the anticipated schedule for each of the three sub-components. The Senaki – Poti – FIZ facilities will be constructed between August 15, 2010 and April 1, 2011. The rehabilitation of the Saguramo – Khashuri pipeline segments, which were expected to be done in 2011, with completion by December 31, 2011, is expected to be replaced by a different project. The durations identified for the various tasks are planned to occur within the 2011 calendar year.

Deliverables will include the following reports:

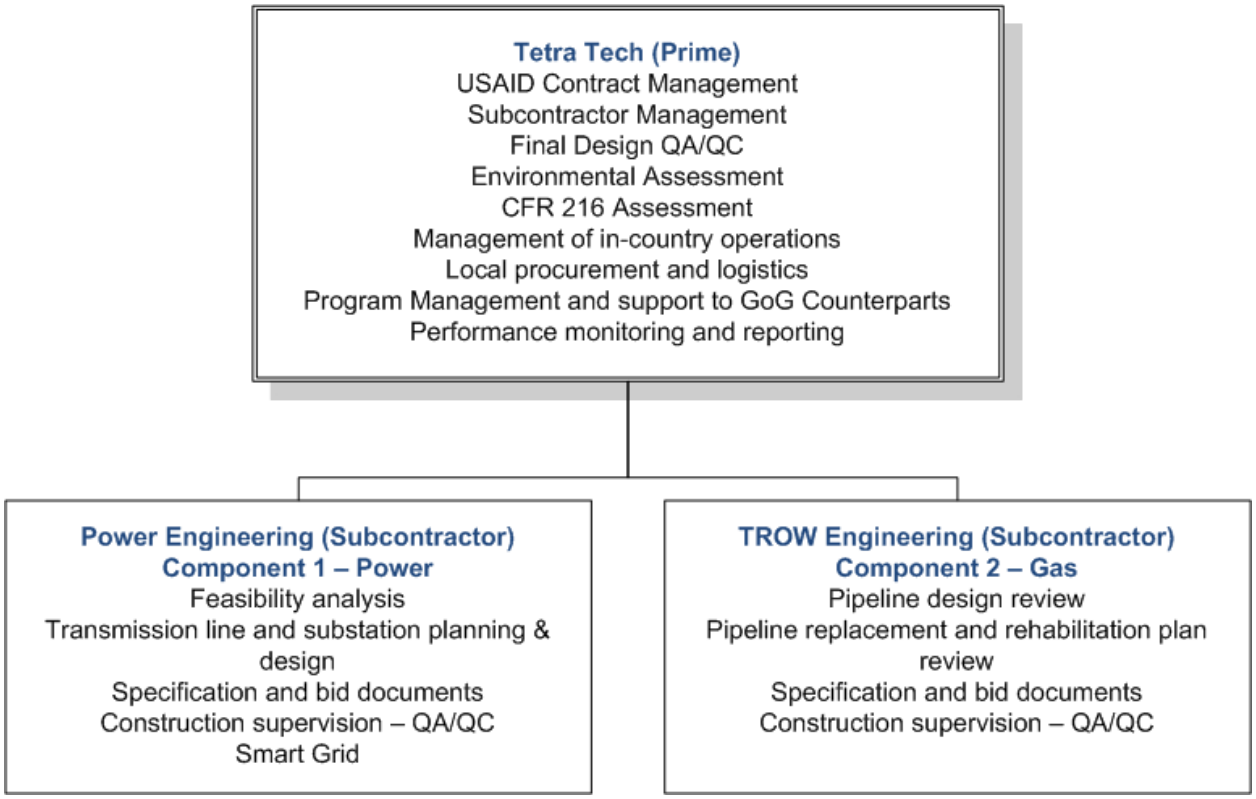
- A report for each segment of the East-West pipeline repaired, rehabilitated, or constructed with USG resources that will be reviewed and approved, including discussion of the capacity building efforts undertaken to improve GOGC engineering and cost estimating competence.

- A report covering procurements conducted by the GOGC for works funded by USAID, including an analysis of GOGC procurement capability and capacity, a summary of procurement procedures followed and degree of adherence to procedure, documentation of non-compliances, inconsistencies or areas of concern observed and a discussion of the capacity building efforts undertaken to improve GOGC procurement competence.

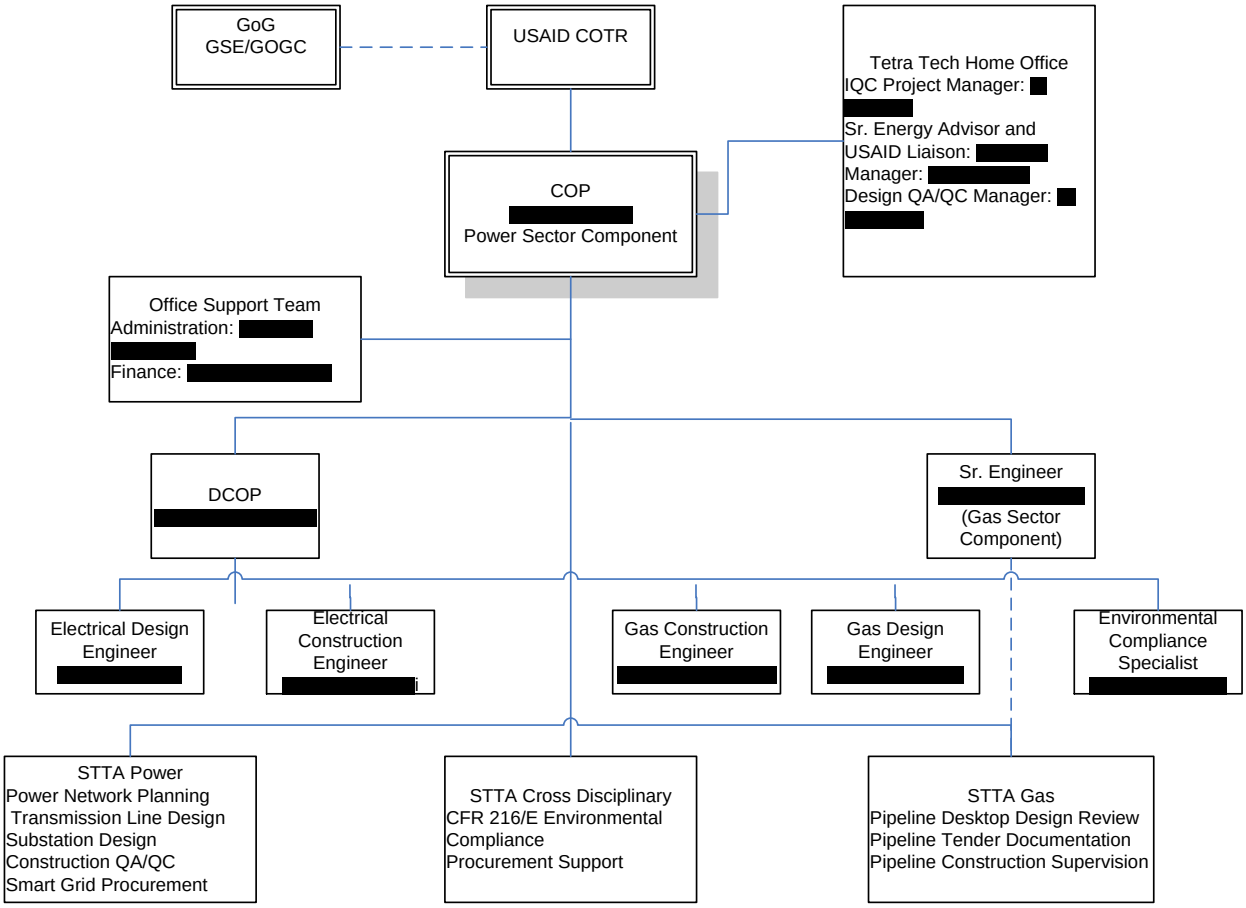
- A report for each subcomponent documenting and depicting actual construction activities and costs, including descriptive text, contracts, invoices, as-built drawings and other relevant information.

Appendices

Appendix 2: Team Composition and Organizational Roles and Responsibilities



Appendix 3: Project Personnel Organization



Appendix 4: Project Level of Effort by Year (Days)*

Name/Position (affiliation)	Year 1 May-Sept 2010	Year 2 Oct 2010 - Sep 2011	Year 3 Oct 2011 - Sep 2012	Total
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Name/Position (affiliation)	Year 1 May-Sept 2010	Year 2 Oct 2010 - Sep 2011	Year 3 Oct 2011 - Sep 2012	Total
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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**Should there be a reasonable requirement under project to replace, reallocate or otherwise amend the LOE, Tetra Tech will submit to USAID a separate request with supporting justification.*

Appendix 5: List of Personnel

Home Office

[redacted]

Key Personnel

[redacted]

Keystone XL Pipeline, a 1,375 mile, 36" pipeline that will supply crude oil from Alberta, Canada to refineries in Texas. His responsibilities include safety, civil surveys, field inspection, land tract assessment, and planning. He holds a BS in civil engineering and an MA in education.

Other Long-Term Personnel

[redacted]

Short-term Specialists

Electricity Sector Specialists

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Gas Sector Specialists

T[redacted]

[redacted]

[redacted]

[redacted]

Cross-Disciplinary Sector Specialists

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Appendix 6: Branding and Marking Plan

BRANDING IMPLEMENTATION PLAN AND MARKING PLAN
Georgia Power and Gas Infrastructure Project

Tetra Tech is experienced in implementing and complying with Automated Directives System (ADS) 320, which addresses branding and marking requirements for USAID acquisitions. We understand the importance of integrating the branding and marking plans into the implementation activities of the Georgia Power and Gas Infrastructure Project. By using this approach, all U.S. foreign assistance activities under this task order will be best identified as being provided "from the American People." Tetra Tech is committed to working with the USAID Mission to help reinforce its identity as America's "good-news story" and make this particular foreign assistance effort more visible and better known in Georgia. Ensuring visibility is the purpose of branding and marking. The strategy outlined below will be developed into a detailed branding and marking plan after the contract award in consultation with and upon approval by USAID/Caucasus.

BRANDING STRATEGY

With reference to Section 320.3.2.1 of ADS 320, below is the required branding strategy for the PGIP Project.

- **Program Name:** Georgia Power and Gas Infrastructure Project (PGIP)

- **How the materials will be positioned:** The PGIP will use full branding and the USAID tagline "From the American People" on materials and communications, which may be translated into local languages as appropriate. Co-branding and no branding will only be considered on a case-by-case basis as considered appropriate by the contracting officer's technical representative (COTR) and contracting officer (CO).

- **Desired level of visibility:** PGIP has a desired high level of visibility within USAID since the purpose of the project is to raise the awareness to government, industry, and community leaders about USAID's support of water and environmental issues in Georgia.

- **Any other organizations to be acknowledged:** Project documents will not use the Tetra Tech logo but will acknowledge that the document was prepared for USAID/Caucasus by the PGIP prime contractor, Tetra Tech. Georgian beneficiary organizations will also be acknowledged on documents and informational materials as appropriate.

There are no controls on the contractor's release or use of data that Tetra Tech, or any subcontractor, produces in performing the contract. The IQC contract for this task order states that copyrights and rights to data shall be in accordance with the clause of the IQC contract entitled "Rights in Data – General" (FAR 52.227-14, Alternates III and IV).

BRANDING IMPLEMENTATION PLAN

With reference to Section 320.3.2.2 of ADS 320, below is the required branding implementation plan for the PGIP Project.

1.0 HOW TO INCORPORATE THE MESSAGE

Tetra Tech will use full branding and the USAID tagline "From the American People" on materials and communications. Co-branding and no branding will only be considered on a case-by-case basis as considered appropriate by the contracting officer's technical representative (COTR) and contracting officer (CO).

2.0 HOW TO PUBLICIZE THE PROGRAM

This section discusses how Tetra Tech plans to publicize the program and also includes a description of the communications tools to be used.

2.1 Audiences

Subject to approval by USAID, the PGIP has the following target audiences with whom it will promote and publicize USAID sponsorship:

2.1.1 Primary audience: The primary audience for all materials and documents produced under this task order is the Government of Georgia officials, industry leaders, city officials, and community leaders.

2.1.2 Secondary audience: The secondary audience for materials and documents produced by the PGIP includes Georgian citizens in general.

2.2 Messages

In all materials and events, the project will be branded as from USAID and prepared by Tetra Tech as part of the PGIP Project. As such, all materials will acknowledge that they were produced with support "from the American people." In cases where a local language predominates above English, the appropriate translation into the local language will be used in branding the program.

Additional ideas to increase awareness that the American people support this program include the fact that all of the trainers will be trained to include in each presentation or training session a statement at the beginning of the meeting or training session that the technical assistance that they provide and the other program services are made possible as a result of "the assistance from the American people." The PGIP Project will follow specific procedures for including the branding implementation plan requirements as stated in the mandatory internal reference, Branding and Marking in USAID Direct Contracting in the Automated Directives System, Chapter 320.

3.0 TOOLS

Specific communications tools we develop will be determined by task order requirements. Typically, in-person meetings and events are the most effective means of spreading awareness among citizens. To reach the attention of the broader public in Georgia, Tetra Tech may cooperate with local media to publicize projects via newspapers, radio, and television coverage. For "higher tech" audiences at a group event such as workshops, we may distribute CDs with electronic versions of promotional materials. Examples of communication tools we anticipate using to publicize contract activities include the following:

- Press releases
- Press conferences
- Media interviews
- Site visits
- Workshops and scoping sessions
- Success stories
- Beneficiary testimonials
- Professional photography
- Public service announcements
- Videos
- Webcasts, e-invitations, blast e-mails, or other internet activities

4. 0 KEY MILESTONES AND OPPORTUNITIES

The following key milestones are anticipated to generate awareness that the program is from the American people. These milestones may be linked to specific points in time, such as at the beginning or end of a program, or to an opportunity to showcase reports or other materials. These include, but are not limited to

- Holding training events
- Publishing reports
- Highlighting success stories
- Promoting final or interim reports
- Communicating program impact/overall results

5.0 ACKNOWLEDGEMENTS

5.1 Acknowledging USAID and Indefinite Quantity Contract Funding Mechanism

The following acknowledgment will be included on external USAID PGIP publications and internal publications, such as quarterly reports, as appropriate:

This document was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech for the Georgia Power and Gas Infrastructure Project (PGIP).

5.2 Acknowledging Host-County Governments

All PGIP documents will follow USAID branding guidelines. If during the course of this program other major sponsors are involved, we will advise the COTR of their involvement and request permission to include them, as necessary.

5.3 Acknowledging Other Host-Country Partners

Co-branding with civil society groups will occur when these organizations have contributed funds to the activity. Co-branding with in-country partners may also be desirable when trying to promote local ownership and capacity building. However, when products are fully funded by USAID, CO approval is required for any exceptions to full branding requirements.

5.3 Co-Branding with Other International Organizations

In cases involving co-branding with other international organizations, USAID guidelines for co-branding will be followed, assuming the funding contributed is more than a token amount.

MARKING PLAN

With reference to Section 320.3.2.3 of ADS 320, below is the required marking plan for the PGIP Project. Tetra Tech developed this marking plan to specify the types of public communications, commodities, and program materials that will be marked with the USAID Identity under the PGIP Project. We will ensure compliance with USAID's policy that programs, projects, activities, communications, and commodities implemented or delivered under contracts and subcontracts exclusively funded by USAID are marked exclusively with the USAID Identity. In general, each required item will be marked with the following statement:

> "This project/report/document/equipment (specify) was made possible by the United States Agency for International Development and the generous support of the American People through the USAID-funded Georgia Power and Gas Infrastructure Project (PGIP)."

Table 1 outlines the types of materials that may be produced under PGIP. Any materials that are not anticipated below but are produced under the initiative will also be subject to branding guidelines and CO approval, as appropriate. Please note that marking is not required on items used as part of the administration of the contract, such as stationery products, equipment, and offices. The goal is to mark programs and projects, not implementing partners. Thus, letterhead, name tags, business cards, office space, equipment, and supplies are not subject to branding.

Every contract deliverable that is marked with the USAID identity for the PGIP will follow design guidance for color, type, and layout in the *Graphic Standards Manual* as related to equipment, reports, studies, events, and public communication (including printed products, audio, visual, and electronic materials). The USAID logo will be used for programmatic correspondence. Tetra Tech letterhead will be used for administrative matters and will not have the USAID logo. Business cards will not show the USAID logo.

Table 1. Marking Plan for Materials to be Produced Under the PGIP		
Category	**Type of Marking**	**Remarks**
Administrative		
Stationery products (administrative business)	USAID standard graphic identity will not be used.	Pertains to letterhead, envelops, and mailing labels
Stationery products (program related)	USAID standard graphic identity will be used.	Pertains to letters that accompany program materials
Business cards	USAID standard graphic identity will not be used on business cards. Tetra Tech will use its own business cards but include the line "PGIP" on the business card.	
Office signs	USAID standard graphic identity will not be used to mark project offices.	
Project deliverables	Follows guidelines for full branding	
Website		
Technical		
Technical reports and studies	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Briefing papers, memoranda, and policy recommendations	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Government policies, strategies, plans, and guidelines (regional, national, and sub-national levels) or other materials positioned as being from the host-country government	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	

Organizations' policies, strategies, plans, and guidelines Logistics, a workplace antidiscrimination policy) or other materials positioned as being from the host-country partner	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Training materials and manuals	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
CDs-ROM	The USAID identity will be printed on the CD label, splash screen/menu, and packaging; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
PowerPoint presentations	The USAID identity is required on title breaker slides; design follows guidelines for the full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Conference posters and presentations	The USAID identity will be printed on the poster or presentation; design follows guidelines for professional meetings or full branding unless co-branding acceptable or an exemption is provided for no branding.	
Videos	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Program materials	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Technical web portal	Follows guidelines for co-branding; the USAID identity will be included on the homepage and sub-pages as appropriate	Individual documents included on the portal will be branded as appropriate.
Promotional		

Event signs, banners, and exhibition booths materials	The USAID identity will be printed on the materials; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Project promotional materials (e.g., success stories, beneficiary announcement of research, testimonials, findings, or project results)	The USAID identity printed on the materials; design follows guidelines for full branding.	
Materials for policy launch	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Materials for site visits	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	
Commodities		
All commodities	The USAID identity will be printed on the cover of documents; design follows guidelines for full branding unless co-branding is acceptable or an exemption is provided for no branding.	